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Adverse Childhood Experiences Impact Burnout in Athletic Trainers: An Exploratory Study

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2 Exploratory Study

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5 **Context:** Burnout, a state of physical or emotional exhaustion, is a concern within
6 athletic training, as between 17 and 40% of athletic trainers (ATs) report high levels of
7 burnout. Adverse childhood experiences (ACEs) are linked with higher levels of burnout
8 in other health professions.

9 **Objective:** To compare burnout to ACEs in athletic trainers.

10 **Design:** Cross-sectional study.

11 **Setting:** Web-based survey.

12 **Participants:** 1000 ATs were selected at random to participate in the study. 78 ATs
13 started the survey, with 75 ATs completing the survey.

14 **Main Outcome Measures:** Burnout as measured by the Copenhagen Burnout Index
15 (CBI) overall and subscale scores were compared across groups based on number of
16 adverse experiences as measured by the ACES survey. Multiple ANOVAs were used to
17 determine the association between ACE score and overall, personal, work, and patient-
18 related burnout. Bonferroni post hoc corrections were used, and the *a priori* alpha level
19 was $p \leq .05$. The study protocol was approved by the IRB.

20 **Results:** At least one adverse experience was reported in 37 (49.33%) participants.
21 Those with 4 or more ACEs had higher odds of reporting overall, personal and work-
22 related burnout than those with 0-3 ACEs. Moderate burnout (CBI ≥ 50.00) was reported
23 in 27 (36%; overall), 44 (58.67%, personal), 34 (45.3% work-related), and 15 (20.00%,

24 patient-related) ATs. Participants with 4 ACEs had significantly higher overall burnout
25 (67.11±19.89; ANOVA $F_{6, 68}=2.59$, $p=.03$) than those with 0 (40.53 ±17.12, $p=.04$), 1
26 (38.42±20.99, $p=.04$), and 7 (19.08±12.09, $p=.03$) ACEs. The same pattern existed with
27 personal burnout as participants with 4 ACES (76.67 ±17.33) had significantly higher
28 scores (ANOVA $F_{6, 68}=3.40$ $p=.00$) than those with 0 (46.60 ±17.49, $p=.02$), 1
29 (42.78±21.48, $p=.01$), and 7 (27.08±20.62, $p=.03$) ACEs. No other significant
30 differences existed.

31 **Conclusion:** Between 20.00% and 58.67% of ATs surveyed reported some form of
32 burnout. Higher levels of overall and personal burnout were found in those with 4 ACEs.
33 While it was expected to see lower levels of burnout in those with lower ACEs, it was
34 surprising to see that those with 7 reported some of the lowest CBI scores. It might be
35 beneficial for ATs with childhood trauma to engage in self-regulation exercises to
36 reduce limit triggers and burnout. Additionally, employers should explore becoming
37 trauma-informed workplaces to better support employees.

38 **Key Words:** Resiliency, trauma, well-being

39 **Abstract Word Count:** 367

40 **Manuscript Word Count:**

41 **Key Points:**

- 42 • Between 20 and 60% of athletic trainers surveyed experienced moderate to
43 severe burnout.
- 44 • Athletic trainers with 4 adverse childhood experiences reported significantly
45 higher levels of overall and personal burnout than athletic trainers with 0, 1, and
46 7 adverse childhood experiences.

47 Burnout is mental state of emotional or physical exhaustion or a stress reaction
48 to a person's inability to cope with the demands of their profession.¹ It affects individuals
49 on personal, work-related, and patient-related levels and ranges from mild to moderate
50 to severe.² Burnout in health care providers can lead to serious health consequences
51 for both the patient and the provider, as well as negatively impact the workplace.
52 Physicians and ATs experiencing burnout are more likely to report a medical error,
53 which could result in patient harm.^{3,4,5} Even if a provider with burnout doesn't commit an
54 error, they tend to have lower empathy for their patients,⁶ which could harm the patient-
55 provider relationship. Within providers, those experiencing burnout are more likely to
56 experience insomnia than those without burnout.⁷ Additionally, individuals with burnout
57 have a higher triglyceride glucose index, which is indicative of insulin resistance.⁸
58 Burnout also impacts mental health, as it is associated with increased anxiety⁷ and
59 suicidal ideations.⁹ Also, it is associated with increased binge drinking episodes,¹⁰ as
60 well as intent to leave the profession.¹¹ In the workplace, there are increased costs due
61 to increased employee turnover because of burnout.¹²

62 Burnout is present in a wide variety of health care professionals, including athletic
63 trainers,^{3,10,11,13,14} neurologists,¹⁵ physicians,¹⁶ nurses,^{16,17} and mental health providers.¹⁸
64 Both environmental and personal factors may lead to burnout.¹³ Environmental factors,
65 also known as occupation-related, include time intensive work hours, high work setting
66 demands, and patient load.¹³ Personal factors include limited leisure time and increased
67 stress levels.¹³ Emerging research suggests another consideration for burnout is a
68 personal factor; the provider's history of adverse childhood experiences (ACEs).¹⁸⁻²⁰

69 First described by Felitti et al., ACEs are childhood exposures to traumatic events,
70 including emotional, physical, and sexual abuse, household dysfunction, as well as
71 community violence and poverty.²¹ Approximately 58% of adults in the US experienced
72 at least one adverse childhood event, with emotional abuse the most common.²²
73 Regardless of the exposure experienced, ACEs are linked to a wide range of physical,
74 mental, and behavioral health risks across the lifespan.²⁰ Those who reported one or
75 more ACE exposure had moderate to high insulin resistance.²³ Sleep is also impacted
76 by ACEs. Individuals with insomnia who reported moderate to severe traumatic
77 experiences had increased awakenings and movement arousal compared to those who
78 reported no or low ACEs.²⁴ Adverse childhood experiences are also associated with
79 lower levels of mental health and wellness. There are higher odds of suicidal ideation in
80 individuals with 4 or more ACEs,²⁵ and those with 3 or more ACEs have increased
81 anxiety and depression risk.²⁶ Lastly, ACEs are linked with increased risk in behavioral
82 health with 4 or more ACEs associated with an increased risk of alcohol and illicit drug
83 misuse.^{21,25}

84 The impact of ACEs goes beyond one's health. In the workplace, employees with
85 higher ACEs scores reported lower levels of workplace well-being, include lower
86 perceived value and decreased social relationships with co-workers.²⁷ Additionally,
87 exposure to ACEs may increase levels of burnout.^{18,19} Physicians with 4 or more ACEs
88 had between 2.67 and 2.75 greater chances of burnout than those with 3 or fewer
89 ACEs.¹⁹ Mental health providers with a history of ACEs experienced significantly higher
90 burnout than those without a history. This was most evident in those who reported
91 feeling unloved and living with a family member with mental illness.¹⁸ The increased risk

92 of burnout is not limited to professionals, as nursing students with higher ACEs were
93 more likely to report burnout.²⁰

94 While the ACEs survey has been used to study its impact on burnout in other health
95 care professions, it has not been used to examine burnout in athletic trainers. The
96 primary purpose of this study was to examine the prevalence of burnout and ACEs in
97 ATs. We hypothesized that burnout prevalence would be similar to prior research
98 involving ATs and we estimated that ACEs prevalence would match the general
99 population. The secondary aim of this study included assessing the influence of ACEs
100 on burnout in athletic trainers. We hypothesized that ATs with 4 or more ACEs would
101 report higher levels of burnout than those with 3 or fewer ACEs.

102 **Methods**

103 **Study Design**

104 A cross-sectional study was conducted to compare athletic trainers' reported
105 burnout by adverse childhood experiences.

106 **Participants**

107 To be included in this study, potential participants were Board of Certification
108 certified athletic trainers who were members of the National Athletic Trainers'
109 Association (NATA). Additionally, they must have been employed in a clinical-based
110 setting (e.g., college, clinic, secondary school). Potential participants were excluded if
111 they did not read English.

112 We recruited participants at random through the NATA's Research Survey
113 Service. One thousand athletic trainers were emailed and invited to participate by
114 completing a survey on Qualtrics. The survey was open for 28 days and weekly

115 reminders were sent to the selected athletic trainers. Participants consented to
116 participating in the study by starting the survey and the University Institutional Review
117 Board approved the study.

118 **Survey**

119 The survey consisted of 3 sections: demographic information, the Adverse
120 Childhood Experiences (ACEs) Questionnaire, and the Copenhagen Burnout Inventory
121 (CBI). There were 34 total items and the survey took about 10 minutes to complete. At
122 the close of the survey, participants were provided with a list of support resources (e.g.,
123 ATs Care, Crisis Text Line).

124 Demographic information was used to ensure participants met the inclusionary
125 criteria, as well as obtain information about the participants. Questions addressed work
126 setting, age range, job title, and gender. The questions used were designed to match
127 how the data were reported in the NATA's Salary Survey to help us be able to compare
128 the respondents to the greater population. It is important to note that at the time, the
129 NATA did use "male" and "female" as designations for gender, which is the
130 nomenclature we followed in our study. Additionally, respondents were asked to provide
131 an estimate of hours worked per week across the fall, winter, spring, and summer
132 seasons.

133 The ACES Questionnaire was used to determine the participant's prior
134 experiences with adverse experiences. It is a 10-item survey with yes/no questions
135 about the participant's experiences during their first 18 years of life. Items address 3
136 categories of ACES; abuse (n=3), neglect (n=2), and household dysfunction (n=5).¹³
137 The questionnaire has good test-reliability²¹ and good internal consistency ($\alpha = .71$ -

138 .88).^{18,28,29} Our study had an acceptable Cronbach alpha reliability coefficient ($\alpha = .75$).
139 Total “yes” responses were summed for each participant and used to group participants.

140 The CBI is a publicly available survey designed to measure burnout and is
141 appropriate for use in health professionals.³⁰ It consists of 19 items with 3 subscales:
142 personal, work-related, and patient-related. The personal subscale is 6 questions and
143 designed to assess physical and psychological fatigue, regardless of the person’s
144 occupation.² The work-related subscale consists of 7 questions and is designed to
145 assess perception of physical and psychological fatigue related to work. One of the
146 work-related subscale questions is reverse scored. Finally, the patient-related subscale
147 measures perception of physical and psychological fatigue related to working with
148 patients. All items are answered using one of two 5-point Likert scales [i. e., always (1) -
149 never/almost never (5); to a very high degree (1) - to a very low degree (5)]. A
150 response of 1 is awarded 0 points, 2 is 25 points, 3 is 50 points, 4 is 75 points and 5 is
151 100 points. Point values are used to create average scores for each subscale and an
152 overall burnout score. Scores range from 0-100, with values below 50 indicating no to
153 low burnout, between 50 and 75 indicating moderate burnout, 75 and 99 severe burnout
154 and 100 total burnout. The CBI has high internal validity in all 3 subscales ($\alpha = .85 -$
155 $.87$).² Our study had high Cronbach alpha reliability coefficients on all 3 subscales
156 (personal $\alpha = .90$, work-related $\alpha = .91$, patient-related $\alpha = .92$). Overall and subscale
157 scores were calculated for each participant.

158 **Analysis**

159 We analyzed data with descriptive and inferential statistics using SPSS (Version
160 28.0.0.0, IBM). Pearson and point biserial correlations were used to assess if gender or

161 hours worked were significantly associated with CBI scores. Odds ratios were
162 calculated to determine if exposure to 4 or more ACEs was linked to higher chances of
163 overall, personal, work-related, and client-related burnout. To determine the effect of
164 ACEs on burnout, analyses of variance were used to compare overall and CBI
165 subscales across total ACEs reported. If any of the ANOVAs were significant, a
166 Bonferroni post-hoc test was used to determine which groups differed from each other.
167 The a priori alpha level was set at $p \leq .05$.

168 **Results**

169 **Participant Characteristics**

170 A total of 78 participants began the survey (response rate = 7.8%), while 76
171 completed demographic information and 75 completed the whole survey for a
172 completion rate of 96.15%. Patient characteristics including gender, age groups,
173 employment setting and position title are in Table 1. Average weekly hours worked was
174 42.80 ± 9.66 (fall = 52.07 ± 11.87 , winter = 43.25 ± 10.60 , spring = 46.13 ± 12.36 ,
175 summer = 27.34 ± 14.32).

176 **Odds Ratios**

177 Athletic trainers with 4 or more ACEs had greater odds of reporting overall,
178 personal, and work-related burnout than those with 0-3 ACEs. They had lower odds of
179 reporting client-related burnout. Results are in Table 2.

180 **Adverse Childhood Experiences and Burnout**

181 Burnout results are reported in Table 3. Gender and hours worked were not
182 significantly correlated with burnout. Moderate to high burnout (CBI ≥ 50.00) was

183 identified in 27 (36%; overall), 44 (58.67%, personal), 34 (45.3% work-related), and 15
184 (20.00%, patient-related) participants.

185 In this sample, 37 (49.33%) participants disclosed at least one ACE. Of those, 15
186 had just one ACE, while 22 reported more than one. The highest ACE score was 7.
187 ACE score distributions are part of Table 3. The most common “yes” responses
188 included separation or divorce of parents ($n=18$, 24.00%), a family member being
189 depressed, mentally ill or attempting suicide ($n=16$, 21.33%) and living with someone
190 who was a problem drinker or used street drugs ($n=13$, 17.33%).

191 Burnout values are reported by ACE scores in Table 4. Observed power and
192 effect size are also reported in Table 4. The ANOVAs for Overall ($F_{6, 68}=2.59$, $p=.03$)
193 and Personal Burnout ($F_{6, 68}=3.40$, $p<.001$) were significant. After the Bonferroni post-
194 hoc test, we saw that participants who reported 4 ACES had significantly greater overall
195 burnout (67.11 ± 19.89) than those reporting 0 (40.53 ± 17.12 , $p=.04$), 1 (38.42 ± 20.99 ,
196 $p=.04$), and 7 (19.08 ± 12.09 , $p=.03$) ACES. We saw a similar pattern with respect to
197 personal burnout. Participants with 4 ACES (76.67 ± 17.33) had significantly higher
198 scores than those with 0 (46.60 ± 17.49 , $p=.02$), 1 (42.78 ± 21.48 , $p=.01$), and 7
199 (27.08 ± 20.62 , $p=.03$) ACES. We did observe a trend towards significance with both
200 work- ($F_{6, 68}=1.98$, $p=.08$) and patient-related ($F_{6, 68}=2.08$, $p=.07$) subscales. Both the
201 work and patient-related subscales were under-powered but had a large effect size.

202 Discussion

203 To our knowledge, this is the first study to examine the relationship between
204 adverse childhood experiences and burnout in athletic trainers. Our study found that
205 ATs who reported 4 ACEs were more likely to report overall, personal and work-related

206 burnout. They also had significantly greater overall and personal burnout than those
207 who reported 0, 1, and 7 ACEs. Our hypothesis was partially supported. Adverse
208 experiences from childhood may predispose some athletic trainers to burnout.

209 Our sample was slightly lower regarding prevalence of adverse experiences in
210 prior research^{18,22} and the most common type of ACE experienced was related to
211 household dysfunction. Our findings of increased burnout based on adverse
212 experiences are supported by similar findings in other health care providers^{18,19} and
213 students.²⁰ What was not observed in other research was our finding that those with the
214 highest ACE score of 7 (n=2) had significantly lower burnout than those with 4 ACEs. It
215 is important to note that self-care may mitigate burnout in individuals with a history of
216 adverse childhood events. Specifically, mental health providers with a history of ACEs
217 who reported using self-care activities had significantly lower levels of burnout when
218 they were compared to those who did not use self-care techniques. Interestingly, this
219 held true for those without a history of ACEs as well, indicating that self-care practices
220 may reduce the risk of burnout.¹⁸ Although we did not ask participants about self-care,
221 this may explain lower burnout in the highest ACEs group.

222 Moderate to high burnout was observed in 20-60% of participants in this sample.
223 The prevalence of personal burnout was the greatest. We found that participants were
224 least likely to report patient-related burnout. Recent studies observed moderate burnout
225 in 17-40% in collegiate ATs,¹⁰ and 26% of secondary school ATs.¹⁴ These values varied
226 compared to what we found; 34% of collegiate ATs had overall burnout (personal =
227 57%, work-related = 45%; patient-related = 18%) and 30% of secondary school ATs
228 had overall burnout (personal = 56%, work-related = 37%, patient-related = 30%). There

229 are different scales to assess burnout, which can make it difficult to compare findings
230 across studies. In studies that used the Maslach Burnout Inventory (MBI), athletic
231 trainers were found to experience burnout related to emotional exhaustion,
232 depersonalization, and low personal accomplishment.^{3,10} While the MBI provides insight
233 into specific elements of burnout, it does not provide an overall burnout score. In our
234 study, the CBI was chosen because it has a broader scope and individually defines a
235 person's burnout level regarding their personal, work-related, and patient-related life,
236 while also providing an overall burnout score.²

237 Exposure to adverse childhood experiences and burnout may lead to similar
238 long-term health concerns. Fortunately, there is evidence that interventions and
239 changes in environmental support can mitigate this risk. Resilience, an individual's
240 ability to overcome stress and adversity,³¹ is associated with decreased risk of poor
241 health outcomes in individuals with ACEs.³² Providing relational skills training for
242 medical providers may help promote resilience.³³ Grit, the perseverance and passion to
243 pursue a long-term goal, counteracts the negative effects of ACEs³⁴ and burnout.³⁵
244 Mindfulness can help improve grit.³⁴ Within collegiate athletic trainers, existential well-
245 being¹¹ and leisure time¹³ are preventative factors for burnout. Sleeping for at least 6
246 hours a night is also theorized to protect against burnout in health care providers who
247 work more than 40 hours per week.³⁶

248 Workplaces can help mitigate burnout by addressing employee well-being. This
249 includes improving workload demands, providing more support for employees, including
250 employees in decision-making, and fostering teamwork.³⁷ Employers must also be
251 aware that adverse childhood experiences do impact employee performance, as

252 employees with a history of ACEs had an increased likelihood of job problems and
253 absenteeism.^{27,38} While we don't encourage employers to ask employees about adverse
254 childhood experiences, employers should work towards becoming a trauma-informed
255 organization to help mitigate the impact of trauma.²⁷ To become trauma-informed, an
256 organization must move through the phases of awareness, sensitivity, response,
257 informed³⁹ while incorporating the principles of safety; trustworthiness and
258 transparency; peer support; collaboration and mutuality; empowerment, voice, and
259 choice; and cultural, historical and gender inclusion.⁴⁰

260 Limitations & Future Research

261 Our study did have some limitations. There was a low overall response rate
262 (7.8%) from the ATs who received the survey, which led to low power in some of the
263 data analysis. Our response rate is noticeably lower than other studies that examined
264 burnout in ATs.^{10,11,13,14} The ACEs questionnaire is personal in nature, which may have
265 made some ATs feel uncomfortable in answering the questions. Athletic trainers
266 experiencing burnout may have been less likely to participate due the nature of burnout,
267 as it is thought they may be overwhelmed by their current situation and not have the
268 capacity to respond to a survey.¹³ It is also important to consider the impact of the
269 COVID-19 pandemic on burnout, as some healthcare workers have increased concerns
270 regarding burnout.^{41,42, 43} Interestingly, an increased pandemic-related burnout was not
271 observed in secondary school ATs.¹⁴ Additionally, since this was an exploratory study,
272 our focus was only on burnout and ACEs. We did not address self-care interventions, as
273 we were concerned that too long of a study would deter participation.

274 Future research should continue to explore this relationship between ACES and
275 burnout within athletic trainers, as well as include ways to assess for comorbidities and
276 mitigating factors. Although the burnout scores patient-related subscale of the CBI were
277 lower than the other burnout measures, the effect of working with patients should be
278 explored, as compassion fatigue and secondary traumatic stress may be more likely in
279 providers with a history of ACEs.¹⁸ Additionally, more intervention-based research
280 addressing improving resilience and grit to reduce burnout is needed. This would allow
281 workplaces to create a more supportive, trauma-informed environment for employees.

282 **Conclusions**

283 We observed that athletic trainers with 4 adverse childhood experiences report
284 significantly higher burnout than those with 0, 1 and 7 adverse childhood experiences.
285 Stresses and trauma during childhood may predispose individuals to burnout. Athletic
286 trainers should be made aware of this relationship to help identify their risk of
287 developing burnout, as well as exploring self-care options to help mitigate burnout.
288 Employers can incorporate trauma-informed practices to help create a more supportive
289 workplace. More research is needed to explore the relationship and to examine if
290 directed interventions may be beneficial to reduce burnout in athletic trainers.

291

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1 **Table 1. Demographics of the Participants (n = 76)**

2

Characteristic	Frequency	Percent
Gender		
Female	52	68.4
Male	24	31.6
Non-binary/Third Gender	0	0.0
Prefer Not To Say	0	0.0
Age Range		
21 – 35 years	47	61.8
36 – 45 years	12	15.8
46 – 55 years	13	17.1
56 – 65 years	0	0.0
65 or older	3	3.9
Employment Setting		
College/University	44	57.9
High School	27	35.5
Hospital	2	2.6
Clinic	1	1.3
Middle School	1	1.3
Other	1	1.3
Position Title		
Athletic Trainer	32	42.1
Director of AT Services	1	1.3
Head Athletic Trainer	14	18.4
Associate Athletic Trainer	3	3.9
Assistant Athletic Trainer	17	22.4
Intern	2	2.6
Graduate Assistant	4	5.3
Other	3	3.9

3 Note: 76 participants provided demographic information. 75 participants completed the survey.

1 Table 2. ACEs and Burnout Odds Ratios

Scale	Odds Ratio	95% Confidence Interval
Overall Burnout	1.15	.32 - 4.19
Personal Burnout	2.20	.53 - 9.07
Work-Related Burnout	1.78	.49 - 6.46
Patient-Related Burnout	.38	.04 - 3.22

2 Note: n = 75. Values greater than 1 indicate greater odd of reporting burnout in those with 4 or more
3 ACEs.

4

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1 Table 3. Burnout Scores and Distribution

Scale	Mean (SD)	Range	Frequency (%)
Overall Burnout	41.90 (18.43)	No/low (<50) Moderate (50-74) High (≥ 75)	48 (64.0%) 24 (32.0%) 3 (4.0%)
Personal Burnout	49.22 (19.67)	No/low (<50) Moderate (50-74) High (≥ 75)	31 (41.3%) 37 (49.3%) 7 (9.3%)
Work-Related Burnout	44.14 (20.66)	No/low (<50) Moderate (50-74) High (≥ 75)	41 (54.7%) 30 (40.0%) 4 (5.3%)
1. Patient-Related Burnout	31.94 (20.64)	No/low (<50) Moderate (50-74) High (≥ 75)	60 (80.0%) 11 (14.7%) 4 (5.3%)

2 Note: N = 75.

3

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1 Table 4. Copenhagen Burnout Inventory (CBI) Means and Standard Deviations by Adverse Childhood Experiences (ACE) Score

2

ACE	N (%)	Overall CBI*	Personal Burnout Subscale*	Work-Related Burnout Subscale	Patient-Related Burnout Subscale
0	38 (50.67)	40.53 (17.12)*	46.60 (17.49)*	42.84 (19.74)	31.69 (20.72)
1	15 (20.00)	38.42 (20.99)*	42.78 (21.68)*	39.76 (24.10)	32.50 (20.42)
2	7 (9.33)	46.99 (12.47)	60.11 (15.56)	45.92 (10.99)	35.12 (16.81)
3	4 (5.33)	40.13 (13.00)	50.00 (11.28)	42.86 (13.04)	27.08 (21.92)
4	5 (6.67)	67.11 (19.89)*	76.67 (17.33)*	70.00 (25.33)	54.17 (18.63)
5	4 (5.33)	40.79 (9.73)	55.21 (14.97)	49.11 (12.84)	16.67 (10.21)
7	2 (2.67)	19.08 (12.09)*	27.08 (20.62)*	23.21 (7.58)	6.25 (8.84)
Overall	75 (100.00)	41.90 (18.43)	49.22 (19.67)	44.14 (20.66)	31.94 (20.64)

3 Note. ANOVA_{Overall} $F(6, 68) = 2.59, p = .03^*$, observed power = .82, partial eta squared = .19, 0 v 4 ACEs $p = .04^*$, 1 vs 4 ACEs $p = .04^*$, 4 v 7 ACEs $p = .03$; ANOVA_{Personal} $F(6, 68) = 3.40 p = .00^*$, observed power = .92, partial eta squared = .23, 0 v 4 ACEs $p = .02^*$, 1 vs 4 ACEs $p = .01^*$, 4 v 7 ACEs $p = .03$; ANOVA_{Work} $F(6, 68) = 1.98 p = .08$, observed power = .67, partial eta squared = .15; ANOVA_{Patient} $F(6, 68) = 2.08 p = .07$, observed power = .71, partial eta squared = .16; * denotes significant at $p \leq .05$.

7

8